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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/526,657

03/02/2005

Lea Di Cioccio

034299-623

5805

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7590

02/25/2010

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EXAMINER

STARK, JARRETT J

ART UNIT

PAPER NUMBER

2823

MAIL DATE

DELIVERY MODE

02/25/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/526,657	<b>Applicant(s)</b> DI CIOCCIO ET AL.	
	<b>Examiner</b> JARRETT J. STARK	<b>Art Unit</b> 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 7-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/18/2009</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see Brief, filed 7/16/2008 & 8/20/2008, with respect to the rejection(s) of claim(s) 7, 10 and 11 under 35 USC § 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Letertre et al.,

### ***Reopening Prosecution***

In view of the Appeal Brief filed on August 20, 2008 PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

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/Matthew S. Smith/

Supervisory Patent Examiner, Art Unit 2823

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 7, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Letertre et al., “QuaSIC Smart-Cut Substrates for SiC High Power Devices” (Letertre).**

**Regarding claims 7 and 11**, Letertre discloses on pages 151-154, a SiCOI type composite substrate manufacturing method comprising the following steps:

- supply of an initial substrate comprising an SiC support bearing an intermediate layer whereon a thin layer of SiC is transferred,

- epitaxy of SiC on the thin layer of SiC,

wherein the epitaxy is conducted at the following temperature:

1450°C to obtain 4H polytype epitaxy on a transferred thin 4H polytype layer.

Letertre is silent upon disclosing silicon oxide as the intermediate bonding layer. Letertre discloses with the preferred embodiment that the intermediate bonding layer comprises tungsten silicide. Letertre does however disclose in paragraph 2 on page 151 that oxide layers are capable of being selected for the purpose of being selected for an intermediate bonding layer between a SiC substrate and a thin SiC being transferred (i.e. producing SiCOI substrates (SiC on insulator)).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select silicon oxide, since it has been held to be within the general skill of a worker in the art to select a known material on the base of its suitability, for its intended use involves only ordinary skill in the art. *In re Leshin*, 125 USPQ 416.

**Regarding claim 10**, Letertre discloses in the 2<sup>nd</sup> paragraph of page 152, wherein several [4h] SiC layers are successively grown epitaxially on the thin [4h] SiC layer.

**Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Letertre in view of Vinod et al., “Fabrication of Low Defect Density 3C-SiC on SiO<sub>2</sub> Structures Using Wafer Bonding Techniques” (Vinod).**

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**Regarding claims 8 and 9**, Letertre discloses the method above but does not specifically disclose wherein before the epitaxy step, an initial substrate preparation step is provided.

Vinod discloses in the 2<sup>nd</sup> and 4<sup>th</sup> paragraph of L18 wherein before the epitaxy step, an initial substrate preparation step is provided that consists of subjecting the surface of the transferred thin SiC layer to an operation selected from polishing etching and hydrogen etching.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the preparation process of Vinod in the method of Letertre for the purpose of smoothing the surface or removing contaminants from the surface.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JARRETT J. STARK whose telephone number is (571)272-6005. The examiner can normally be reached on Monday - Thursday 7:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

2/22/2010

/J. J. S./

Examiner, Art Unit 2823